MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1 2022/2023 (TERM ID 2210)

BFN2254 – FINANCIAL STATISTICAL ANALYSIS

(All sections / Groups)

08 FEBRUARY 2023
2.30 p.m. - 4.30 p.m.
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **6 pages** with **4 questions** only.
2. Attempt **ALL** questions and write your answers in the Answer Booklet provided.
3. Students are allowed to use non-programmable scientific calculators that are permitted to be used in the examination.

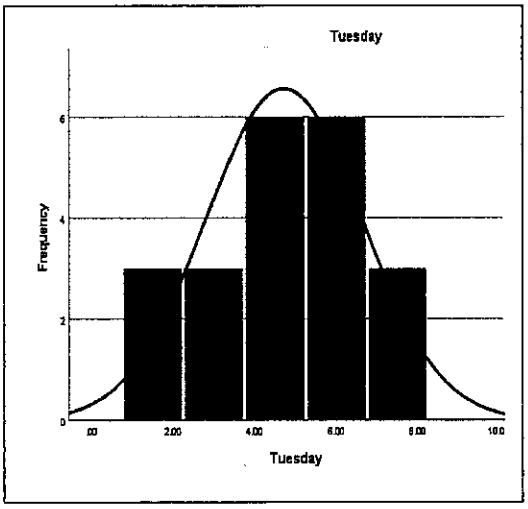
Question 1 [20 Marks]

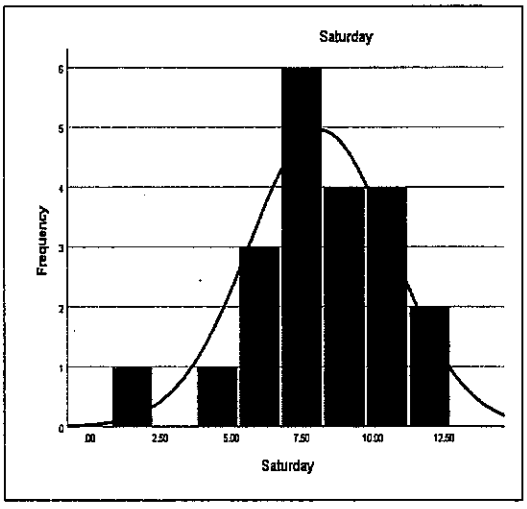
All vehicles entering the Paradise Valley mall parking lot will be charged based on the length of time (in hours) the visitors parked their vehicles. The visitor will be charged at the rate of RM1.50 per hour either weekdays or weekend. The total charges (in RM) on 42 vehicles for two days; Tuesday and Saturday on the same week have been recorded.

Below are the SPSS outputs generated from the charges amount (in RM) of parked vehicles for two days:

Statistics

		Tuesday	Saturday
N	Valid	21	21
	Missing	0	0
Mean		4.7143	8.1429
Median		4.5000	7.5000
Std. Deviation		1.91423	2.53546
Skewness		-0.293	-1.18
Std. Error of Skewness		0.501	.501
Kurtosis		-0.776	0.996
Std. Error of Kurtosis		0.972	0.972
Range		6.00	10.50
Minimum		1.50	1.50
Maximum		7.50	12.00
Sum		99.00	171.00





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a) Discuss the values of minimum, maximum and mean of charges amount relating to the length of hours the vehicles have been parked at the mall parking lot for both days. [6 marks]

b) From the table, discuss on the skewness and kurtosis coefficient values for both days. [6 marks]

c) By visualizing the histograms,
   i. Are both samples normally distributed? Explain. [4 marks]
   ii. Is there any kurtosis issue for both dataset? Explain [2 marks]

d) If there is a car parks for 24-hours on any day, what would be the effect on the average and median for total charges on that day. Discuss it. [2 marks]

Question 2 (25 Marks)

a) The cost of health care is rising faster than most other items. A survey was undertaken to determine whether women have spent more in health-care expenditures compared to men. The survey sampled a group of men and women and recorded their total amount spent of health care. The data were analyzed, and the results were obtained as below. Assume that,

Group 1 - Men *Group 2 - Women*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Gender	Statistic	df	Sig.	Statistic	df	Sig.
AmountSpent	Men	.100	45	.200*	.958	45	.207
	Women	.135	45	.089	.905	45	.110

		Levene's Test for Equality of Variances		t-test for Equality of Means			
						Significance	
		F	Sig.	t	df	One-Sided p	Two-Sided p
Total Purchases	Equal variances assumed	.950	.332	-1.605	88	.056	.112
	Equal variances not assumed			-1.605	87.630	.056	.112

i. Does the data involve independent or dependent samples? Justify your answer. [2 marks]

ii. Does the data follow a normal distribution? [4 marks]

iii. Does the data fulfill the assumption of homogeneity of variances? [5 marks]

iv. At 10% level of significance, can we conclude that women have spent more in health-care expenditures compared to men?
Note: The procedure of checking assumptions is not necessary. [7 marks]

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b) A tax advisory committee attempts to evaluate the results of a tax cut given to individuals during the preceding year. The purpose is to stimulate the theory that the consumer would spend the tax savings when there is a tax reduction. The committee selects a sample of households and records the consumer spending both before and after the legislation of tax-reduction was put in effect as their data analysis.

i. Does the data involve independent or dependent samples? Justify your answer. [2 marks]

ii. Given that the differences data values are badly skewed. Determine the most appropriate hypothesis testing technique in finding evidence whether the tax-reduction policy has achieved its desired goal. State the reason of your choice. [5 marks]

Question 3 (25 Marks)

a) Describe one similarity and two differences between One-way ANOVA test and Kruskal Wallis test in terms of the underlying assumptions or application conditions. [5 marks]

b) During Covid-19 pandemic, the economy was slowing down and companies were laying off their workers. A poll asked a random sample of workers how long it would be before they had significant financial hardships if they lost their jobs and could not find new job. The predictions (in weeks) are recorded and analyzed. They were also classified based on the four (4) income levels. The following output were generated from the data analysis:

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Income Level	Statistic	df	Sig.	Statistic	df	Sig.
Week	More than RM20,000	.123	39	.143	.966	39	.285
	RM10,000-RM20,000	.102	114	.005	.965	114	.004
	RM5,000-RM10,000	.137	81	<.001	.954	81	.005
	Less than RM5,000	.153	67	<.001	.874	67	<.001

Independent-Samples Kruskal-Wallis Test Summary

Total N	301
Test Statistic	55.708[a]
Degree Of Freedom	3
Asymptotic Sig. (2-sided test)	<.001

a. The test statistic is adjusted for ties.

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Pairwise Comparisons of IncomeLevel					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Less than RM5,000-RM5,000-RM10,000	59.898	14.361	4.171	<.001	.000
Less than RM5,000-RM10,000-RM20,000	86.038	13.387	6.427	<.001	.000
Less than RM5,000-More than RM20,000	112.116	17.515	6.401	<.001	.000
RM5,000-RM10,000-RM10,000-RM20,000	26.140	12.637	2.069	.039	.232
RM5,000-RM10,000-More than RM20,000	52.218	16.949	3.081	.002	.012
RM10,000-RM20,000-More than RM20,000	26.078	16.132	1.617	.106	.636

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

i. Based on normality tests table above, does the data qualify for parametric test? [5 marks]

ii. At the 5% level of significance, can we infer that differences of financial survival period exist between the four income levels?
Note: The procedure of checking assumptions is not necessary. [7 marks]

iii. From the pairwise comparison post-hoc test above, which income level of workers significantly differ in terms of their financial survival period? Use p-value approach with 5% significance level. [8 marks]

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Question 4 (30 Marks)

a) An aging schedule classifies outstanding account receivable (average number of days for unpaid credit card bills by customers) according to the time that has elapsed since billing. Particularly, it classifies the proportion of accounts receivable belonging to four groups (number of days outstanding). A large firm has determined its aging schedule for the past five years. However, during the past few months, the economy has taken a downturn.

The company would like to know whether the recession has affected the aging schedule. From a random sample of 250 accounts receivable, the following analysis outputs have been obtained.

Frequency Table: Accounts Receivable

	Observed N	Expected N	Residual
0 to 14 days	159	180.0	-21.0
15 to 29 days	28	37.5	-9.5
30 to 59 days	47	25.0	22.0
60 days and more	16	7.5	8.5
Total	250		

Test Statistics

	AccReceivable
Chi-Square	33.850[a]
df	3
Asymp. Sig.	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 7.5.

i. Based on the outputs, does the aging schedule based on the proportion of accounts receivable classification has changed from the past five years? Use 5 percent significance level. [7 marks]

ii. From the frequency table, which classification groups have shown obvious changes in the frequency of accounts receivable from the past five years? Discuss it. [3 marks]

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b) The Mega Concept Corporation has acquired several office units (over the last 8 years since its establishment. Data are presented below lists the number of office units acquired (in thousands of square feet)) per year from 2014 to 2021.

Year	2014	2015	2016	2017	2018	2019	2020	2021
Units	4.25	3.75	2.30	3.05	2.50	2.50	4.40	6.10

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	3.640149	3.489115	1.043287	0.373488
X Variable 1	0.849939	0.755191	11.125462	0.142305
X Variable 2	-0.91089	0.799749	-21.13897	0.037432

Second-order Autoregressive Model

i. Fit a three-year moving average to the data. [6 marks]

ii. Smooth the series exponentially using a smoothing coefficient of W=0.25. [7 marks]

iii. From the given output, derive the second-order autoregressive model and test the appropriateness of the fitted model at the 5% significance level. [4 marks]

iv. Predict how many office units will be acquired for 2023? [3 marks]

Note: Use two decimal places for all values.

End of Question.